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LIST OF PUBLICATIONS AND PATENTS

JANUARY-JUNE 1947

NORTHERN REGIONAL RESEARCH LABORATORY, PEORIA, ILLINOIS

Bureau of Agricultural and Industrial Chemistry  
Agricultural Research Administration  
United States Department of Agriculture

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PUBLICATIONS

Publications marked (\*) are not available for distribution

THE ABSORPTION OF NIACIN BY YEAST.

By J. M. Van Lanen. Arch. Biochem. 12 (1): 101-111 (January 1947). With a view toward recovering niacin (antipellagra vitamin) from various fermentation liquors and other waste products, the ability of several yeasts to absorb niacin was investigated. It was found that certain yeasts such as distillers' grain yeast and commercial baker's yeast were capable of absorbing from 60 to 70 percent of the crystalline niacin added. Niacin from natural sources also was taken up by the yeast; however, the absorption was appreciably improved when the natural sources of niacin were given prior treatment with alkali.

In synthetic media it was found that the niacin contained in yeast cells grown anaerobically is largely absorbed while that in cells propagated aerobically is largely synthesized.

EXTENDING PHENOLIC RESIN PLYWOOD GLUES WITH PROTEINACEOUS MATERIALS.

By Glen E. Babcock and Allan K. Smith. Ind. and Eng. Chem., Indus. Ed. 39 (1): 85-88 (January 1947).

For the first time data are presented showing that vegetable proteinaceous materials, such as corn gluten and soybean meal, can be used in substantial amounts as extenders for phenolic resin plywood glues. To attain the best results in this combination, it is necessary to use a resin of low molecular weight and proteinaceous materials low in water-soluble constituents. Formulas containing resin and protein materials in the ratio of 6:4 give rapid-curing glue lines which meet the established standards for exterior-grade plywood with a considerable saving in glue cost.

THE POSSIBLE USE OF OATS AND OTHER SMALL GRAINS FOR STARCH PRODUCTION.

By H. M. MacMasters, R. L. Slotter, and C. M. Jaeger. Amer.

Miller and Processor 75 (1): 82-83 (January 1947).

Oats, barley, and rye were studied in comparison with corn as

sources of starch. The comparatively high initial cost, the difficulties of processing, and the low return from byproducts preclude any general acceptance of oats, barley, and rye as raw materials for the production of starch.

SOYBEANS: CERTAIN AGRONOMIC, PHYSICAL, CHEMICAL, ECONOMIC, AND INDUSTRIAL ASPECTS.

By J. H. Shollenberger and W. H. Goss. AIC-74-Revised. February 1947. Mimeographed.

A compilation has been made of factual information on soybeans, giving as completely as possible a picture of this commodity in its various aspects from production to ultimate consumption. It includes original as well as previously published material, and is of interest to growers, handlers, processors, and consumers of soybeans.

CORN, ITS PRODUCTS AND USES.

By J. H. Shollenberger and Carol M. Jaeger. ACE-121-Revised. February 1947. Mimeographed.

A compilation has been made of factual information on corn, giving as completely as possible a picture of this commodity in its various aspects from production to ultimate consumption. It includes original as well as previously published material, and is of interest to growers, handlers, processors, and consumers of corn.

LINSEED PROCESSING MILLS IN THE UNITED STATES.

By W. H. Goss. CL-3. February 1947. Mimeographed.

A list of mills in this country which process linseed to produce linseed oil and oilmeal is given.

\*CATALYTIC ISOMERIZATION OF VEGETABLE OILS.

By S. B. Radlove, H. M. Teeter, and J. C. Cowan. Federation of Paint and Varnish Production Clubs. Official Digest 265: 74-84 (February 1947).

A process for isomerizing linseed and soybean oils by heating with a catalyst composed of metal and carbon-black is described. Preliminary results of the evaluation of the isomerized oils in protective coatings are given.

EDIBLE OIL INDUSTRY IN GERMANY, PARTS I AND II.

By W. H. Goss. Food Industries. Part I, 19 (2): 184-187 (February 1947); Part II, 19 (3): 320-323 (March 1947).

The methods used in Germany for producing and refining vegetable oils are described.

UTILIZATION OF SOYBEAN MEAL IN MOLDED PLASTICS.

By Leonard L. McKinney. AIC-150. March 1947. Mimeographed.

The use of soybean meal in phenolic-type plastics is reviewed with details concerning (1) the technique of preparing meal, (2) formulations, and (3) properties of the plastics. Plastics containing 40 percent resin and having excellent color permanence are obtained with leached soybean meal.

VAPOR PRESSURE AND HEAT OF VAPORIZATION OF ACETYLMETHYLCARBINOL.

By Aaron Efron and Russell H. Blom. *J. Phys. and Colloid Chemistry* 51 (2): 480-483 (March 1947).

Vapor pressures of purified acetyl methylcarbinol have been measured at several temperatures by means of an isoteniscope. Values differ from those reported in the earlier literature, but are believed to be more accurate. The data are depicted graphically and by interpolation the boiling point of acetyl methylcarbinol was found to be 143.6° C.

The average heat of vaporization of acetyl methylcarbinol in the range 99° to 144° C. was found by calculation to be 109 cal./gm. with a probable accuracy of  $\pm$  5 cal.

AGRICULTURAL RESIDUE PULPS--COMPARISON WITH TYPICAL WOOD PULPS.

By S. I. Aronovsky, Alan Rhodes, and E. C. Lathrop. *Paper Trade Jour.* 124 (13): 49-55 (March 1947); *Paper Mill News* 70 (27): 12, 14, 16, 18 (July 5, 1947), 70 (28): 16-18 (July 12, 1947).

The beating and strength characteristics of five agricultural residue soda pulps and some typical wood pulps were compared, using the same methods and equipment for both types of pulps. Standard laboratory beaters with sharp and dulled tackle, a Morden laboratory beater, and a fiber fractionator were among the equipment used. The handsheets and tests were made in accordance with the TAPPI Standards.

The results showed that the agricultural residue pulps compared favorably with wood pulps in all of the strength characteristics except tear resistance. Except for the latter value, wheat straw soda pulp had better strength properties and required much less beating than softwood sulphite pulps. The standard pulp testing equipment and methods are suitable, in the main, for agricultural residue pulps.

C-18 ALCOHOL ESTERS OF ORTHOSILICIC ACID.

By L. B. Falkenburg, H. M. Teeter, and J. C. Cowan. *J. Amer. Chem. Soc.* 69 (3): 486-487 (March 1947).

Orthosilicic acid esters of stearyl, oleyl, and linoleyl alcohols and of the alcohols derived by reduction of the fat acids of soybean and linseed oils were prepared. The orthosilicates of linseed and soybean alcohols were examined for possible use in protective coatings.

THE PREPARATION OF ACETOPROPYL ALCOHOL AND 1,4-PENTANEDIOL FROM METHYLFURAN.

By L. E. Schniepp, H. H. Geller, and R. W. Von Korff. *J. Am. Chem. Soc.* 69 (3): 672-674 (March 1947).

Procedures for the laboratory preparation of methylfuran from furfural and the catalytic reduction of this product in aqueous

medium to produce either acetopropyl alcohol or 1,4-pentanediol are described. It is proposed that 4,5-dihydro-2-methylfuran is the first intermediate produced by the reduction and this is in part hydrolyzed to acetopropyl alcohol and in part reduced to tetrahydro-methylfuran. This dihydromethylfuran was prepared by dehydration of acetopropyl alcohol and reacted with methanol to give 2-methoxy-2-methyltetrahydrofuran, a new compound.

PENICILLIN. X. THE EFFECT OF PHENYLACETIC ACID ON PENICILLIN PRODUCTION.

By Andrew J. Moyer and Robert D. Coghill. J. Bact. 53 (3): 329-341 (March 1947).

Phenylacetic acid, when added to surface cultures of Penicillium notatum NRRL 1249.B21 and to submerged cultures of P. notatum NRRL 832 or P. chrysogenum NRRL 1951.B25, gave marked increases in total penicillin yield. Only in the presence of whole wheat bran in submerged culture was evidence obtained that phenylacetic acid had an effect on the type of penicillin produced. The toxicity of phenylacetic acid could be sufficiently overcome by raising the pH prior to inoculation or by adding the phenylacetic acid during the fermentation after the pH had risen above the critical level. The optimum concentration of phenylacetic acid was between 0.2 and 0.8 g. per liter of medium.

OCTANE RATINGS OF AGRICULTURAL MOTOR FUELS.

By C. F. Elder, F. R. Truby, and Richard Wiebe. Ind. and Eng. Chem. 39 (4): 508-510 (April 1947).

Motor method octane numbers (A.S.T.M. 357-44) have been determined for clear and leaded gasoline blends containing methyl, ethyl, isopropyl, butyl, and amyl alcohols, ketones, ethers, esters, isoctane, neohexane, cyclohexane, benzene, toluene, aromatic amines, and reference fuels.

EXTENDING RESORCINOL RESIN GLUE WITH CORN GLUTEN.

By Glen F. Babcock and A. K. Smith. Modern Plastics 24 (8): 153, 250, 252, 254, 256 (April 1947).

A method for the preparation of a suitable resorcinol resin is described. Corn gluten, a byproduct of the wet milling of corn, is suitable as an extender for resorcinol-formaldehyde cold-setting glue. The extender has been used in proportions up to 40 percent of the total solids content of the glue without apparent loss in water resistance or gluing properties.

COMPANIES OR INDIVIDUALS WHO MANUFACTURE EQUIPMENT FOR REFINING EDIBLE OILS OR WHO ARE SPECIALISTS IN THE TECHNOLOGY OF REFINING.

CL. 6. May 1947. Mimeographed.

\*SOYBEAN RESEARCH AT THE NORTHERN REGIONAL RESEARCH LABORATORY.

By G. E. Hilbert. The Cotton Gin and Oil Mill Press 48 (10): A-16, A-17, Oil Mill Section (May 1947).

Several developments, discovered at the Northern Regional Research Laboratory during 1945 and 1946, on the industrial utilization of soybeans are briefly described.

\*THE NAME 'PENICILLIN.'

By Frank H. Stodola. Nature 159 (4044): 607 (May 1947).

The name "penicillin" was used by Palei and Osuicheva in 1936, 7 years after Fleming first employed the term, to designate a thermo-stable substance isolated from Penicillium luteum-purpurogenum.

INCREASING VALUE OF WASTE PRODUCTS.

By E. C. Lathrop. AIC-156. June 1947. Mimeographed.

Four principles for guiding research into the utilization of waste products are presented: (1) Procurement on a sound economic basis; (2) establish uses based on superior or unique properties; (3) attempt to obtain maximum utilization by producing major co-products; (4) recognize importance of market surveys, sound merchandising plans and proper financing before investment. Examples in the industrial utilization of agricultural residues are presented which show that successful ventures conform to these principles and that unsuccessful ventures fail in one or more respects to conform to the principles.

A DECADE OF SOYBEAN RESEARCH.

By R. T. Milner. The Soybean Digest 7 (8): 21-23 (June 1947).

The work of the U. S. Department of Agriculture on industrial utilization of soybeans for the 10-year period 1936-1946 is briefly summarized. Particular emphasis is placed on the more recent work now in progress at the Northern Regional Research Laboratory.

DEHYDROGENATION OF 1,5-PENTANEDIOL.

By L. E. Schniepp and H. H. Geller. J. Am. Chem. Soc. 69 (6): 1545 (June 1947).

8-Valerolactone has been prepared in 78 percent yield by dehydrogenation of 1,5-pentanediol over a copper chromite catalyst.

CORNCOBS ENTER INDUSTRY

By Elbert C. Lathrop. Yearbook of Agriculture, 1943-1947.

U. S. Department of Agriculture. Pp. 734-738 (1947).

During the years of World War II the industrial utilization of corncobs expanded from about 10,000 tons to 200,000 tons per year. The largest single usage, about 100,000 tons, was for the manufacture of furfural. The Navy used a mixture of ground cobs and rice hulls in the soft-grit blasting method of cleaning airplane engines. Uses as chicken litter, for burnishing of metals, fur cleaning, sweeping compounds, and the like are discussed. About 50 grinding plants were set up to produce cob products.

#### PENICILLIN.

By Kenneth B. Raper. Yearbook of Agriculture, 1943-1947. U. S. Department of Agriculture. Pp. 699-710 (1947). A brief résumé of the major developments leading to large-scale production and use of penicillin is presented. Subjects discussed include: Discovery and early preparation; development of improved production media based upon lactose and corn-steep liquor; development of a tank or submerged fermentation; discovery of higher yielding cultures and the development of improved strains through processes of natural variation and artificially induced mutation; assay and types of penicillin; recovery and chemistry of penicillin; clinical use and applications to veterinary medicine. The information presented is current to October 1946.

#### STARCH FROM WHEAT.

By Cecil T. Langford and Carl E. Rist. Yearbook of Agriculture, 1943-1947. U. S. Department of Agriculture. Pp. 744-749 (1947). A general description is given of the production of wheat starch by two processes developed at the Northern Regional Research Laboratory. In the Batter Process wheat flour is separated into starch and undenatured gluten. This process requires only simple mechanical equipment and is suited for installation in sugar beet factories. Whole wheat grain is wet milled, in the second process, to give starch and byproduct feed. Yield and cost estimates are included for this process. The applicability of the processes and utility of the products are discussed.

#### PATENTS

##### PROCESS FOR OBTAINING INCREASED YIELDS IN THE EXTRACTION OF CORN PROTEINS.

Cyril D. Evans and Chester W. Ofelt. U. S. Patent No. 2,414,195; January 14, 1947. (Assigned to Secretary of Agriculture.)

##### SACCHARIFICATION PROCESS.

Robert Dworschack and Everette M. Burdick. U. S. Patent No. 2,415,734; February 11, 1947. (Assigned to Secretary of Agriculture.)

##### METHODS OF PREPARING A DIASTATIC AGENT.

Lynford J. Wickerham. U. S. Patent No. 2,422,455; June 17, 1947. (Assigned to Secretary of Agriculture.)

